

Week Ahead Forecast January 3, 2022

Hi Folks,

Over the past seven days, precipitation has fallen across the State with the heaviest amounts in the LA Basin as depicted in a map from the National Weather Service's California Nevada River Forecast Center (CNRFC) shown in Figure 1. Accumulations there ranged between 2 and 4 inches.

CNRFC Area Observed Precipitation

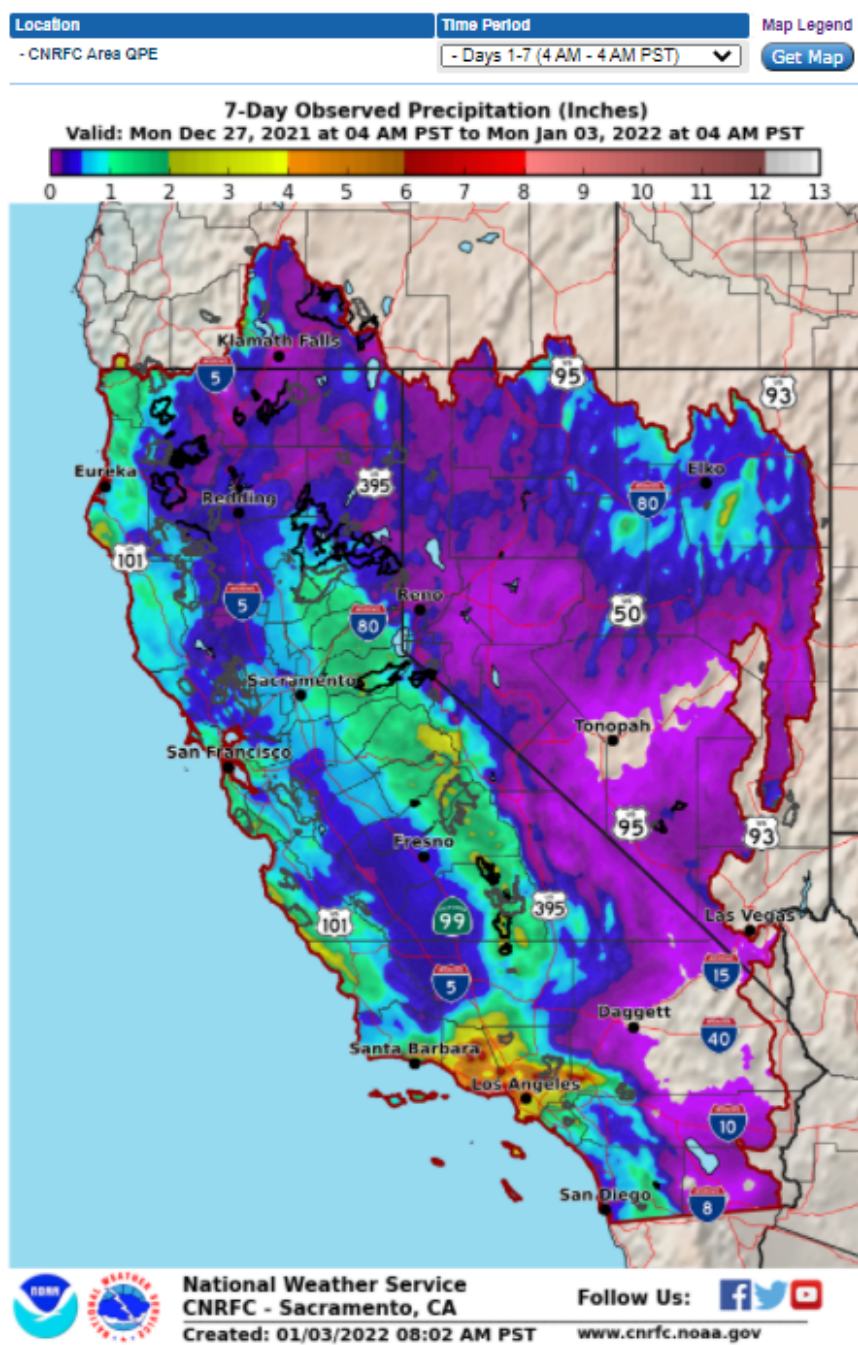


Figure 1. CNRFC map of observed precipitation over the past seven days.

Looking ahead, things dry out with the exception of the North Coast. Figure 2 shows the CNRFC map of forecast precipitation over the next six days. Heaviest accumulations are north of Eureka where between 4 and 9 inches of precipitation are expected. The northern Sierra Nevada also sees some accumulations between 2 and 4 inches, but things are mostly dry south of Sacramento and no precipitation is forecast south of Santa Barbara.

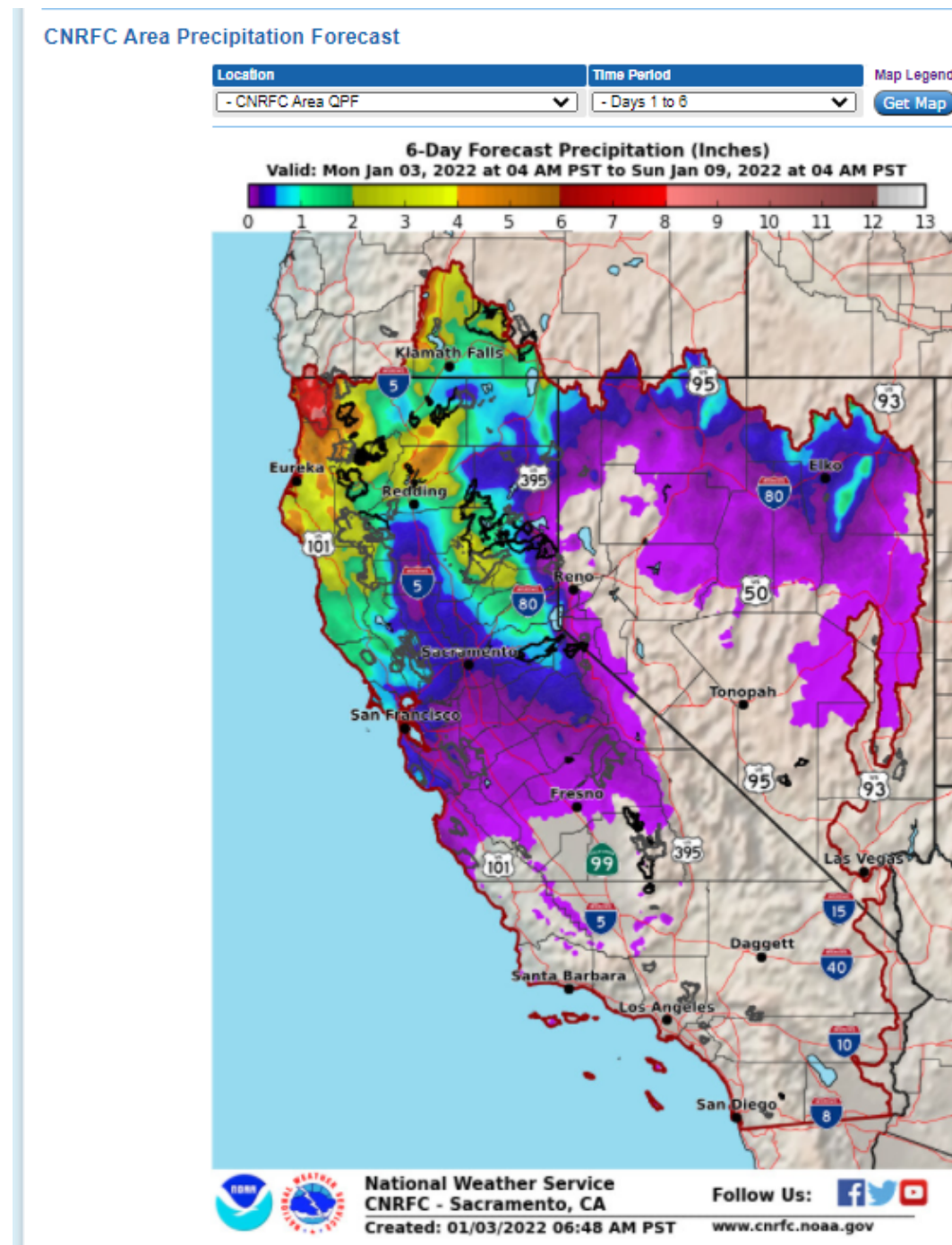


Figure 2. CNRFC map of forecast precipitation from 1/3/22 to 1/9/22.

A high-pressure system offshore of California is pushing precipitation to the north. The tail of the atmospheric river does impact northern California mostly today (1/3) and into tomorrow (1/4). Onshore flow creates showers over the northern Mountains on Wednesday and Thursday before the next system moves through Northern California Friday with showers extending down to Fresno. Saturday 1/9 is expected to be dry across the State. Week 2 looks to be dry as the high pressure establishes a stronger presence in the eastern Pacific. The key to January's precipitation outcome will be how long the high pressure stays in place.

One way to track how the forecasts are evolving is to use a tool from the Center for Western Weather and Water Extremes (CW3E). By going to the IVT forecast page and scrolling down to the AR landfall tool we can see today's atmospheric river (AR) landfall probabilities for the next 2 weeks showing the week 1 storminess (more purple squares offshore of California) and week 2 dryness (light blue squares indicating no AR activity). This is shown in Figure 3 below. In the upper right of the image is a link titled dProg/dT which takes you to a page with the past week's forecasts of AR activity as shown in Figure 4.

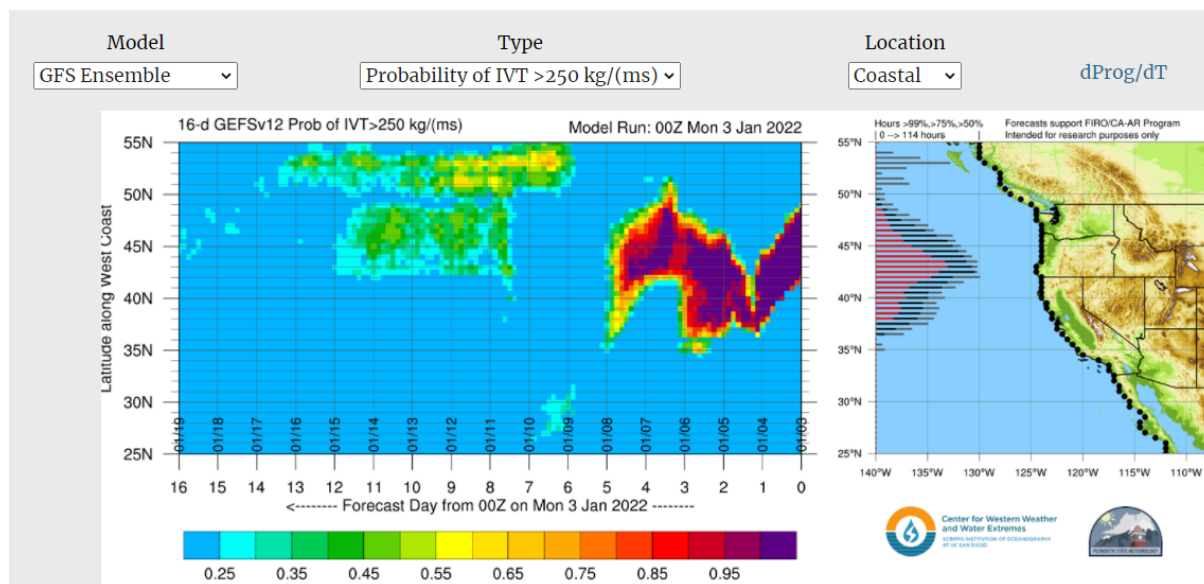


Figure 3. CW3E AR landfall forecast tool showing forecast model agreement of AR conditions at different latitudes throughout the 2-week forecast period.

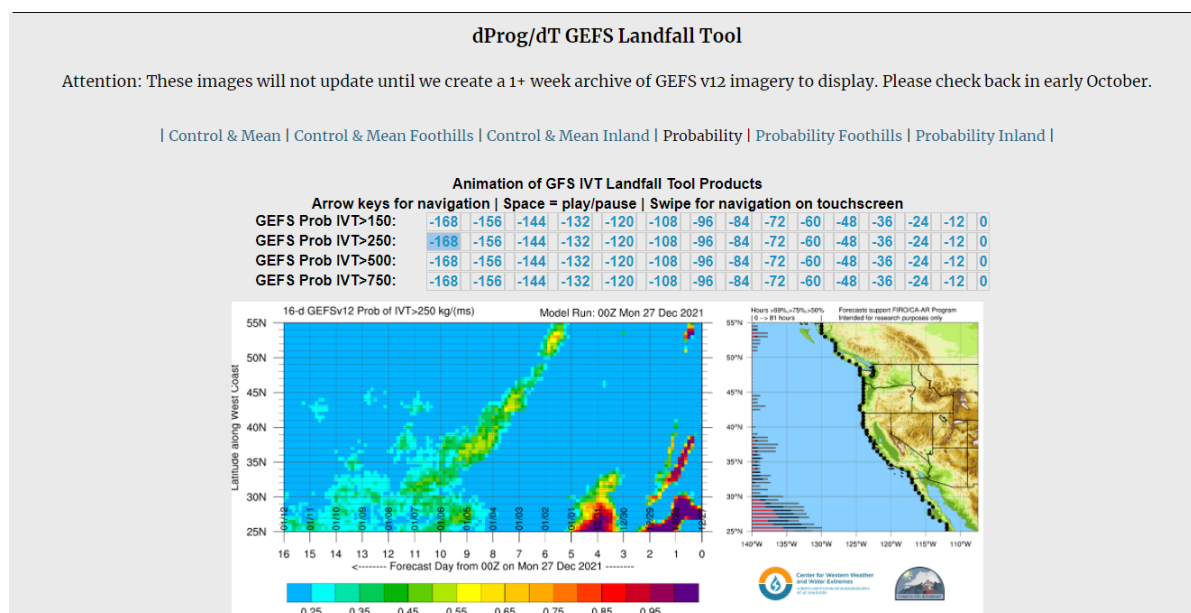


Figure 4. CW3E AR landfall forecast evolution page (<https://cw3e.ucsd.edu/landfall-tool-dprogdt-prob/>)

Starting with the desired threshold of integrated vapor transport (250 is the minimum level to qualify for an atmospheric river designation) and at -168 which is the forecast from 7 days ago. Each link to the right then moves 12 hours ahead all the way up to 0 which is today's forecast. This allows the user to watch how the forecast models changed their depiction of weather conditions leading up to today. This gives a sense of how uncertain conditions are in the forecasts and when the models align at different strengths of AR conditions. The IVT>150 gives an indication of when there is moisture that can create precipitation, but wouldn't be classified as an AR.

With AR precipitation, freezing elevation is a critical parameter as it determines where the rain/snow boundary will be. With this week's storms we can use the CW3E interactive maps to look at the freezing elevation of different HUC-8 watersheds. Figure 5 shows the outlook for the North Fork of the Feather watershed where today's precipitation will largely fall as rain overnight (fourth bar of precipitation colored mostly green). The lines above the bar show the time evolution of the freezing elevation. In Figure 5, the lines start low and increase throughout the day and into the night until they are at the top of the watershed. They then fall back down with the second pulse of precipitation which is much smaller and will mostly fall as a mix of rain and snow (light blue coloring of the bars). From this we would expect some increased runoff with today's precipitation and less so from the precipitation later in the week. Little spread in the lines indicates significant agreement between the different forecast ensemble members with more spread (less agreement) later in the week.

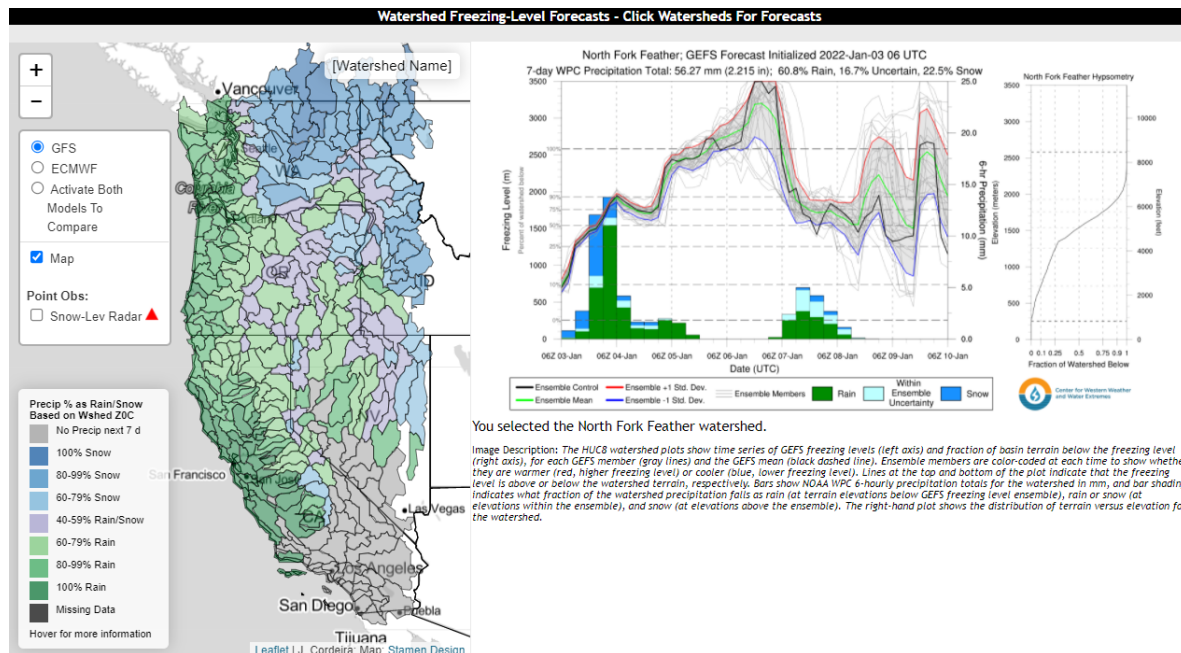


Figure 5. CW3E freezing level forecast tool (https://cw3e.ucsd.edu/DSMaps/DS_freezing.html).

Looking at the range of runoff expected from this week's storm, we can go back to the CNRFC web page and look at the ensemble points and click on the Lake Oroville dot we can look at the 10-day ensemble forecast of inflows which is shown in Figure 6. As the graphic notes, the ensemble only reflects the uncertainty in the weather not in the hydrologic conditions. Reading figure 6, the 10% exceedance inflow forecast shows 225.9 thousand acre-feet flowing into the reservoir by 1/13/22 while the 90% exceedance shows 112.2 thousand acre-feet. The 5-day deterministic forecast shows 70.8 thousand acre-feet flowing in by January 8.

January will be a critical month in determining if December was the beginning of the end of the drought or just a mitigating factor in ongoing drought conditions. Right now the forecast is aligning with seasonal expectations pointing to the latter outcome. I will update the forecast next Monday, January 10, 2022.

Short-Range Peaks	10-Day Probability	10-Day Accum Vol	4x5-Day Probability	Monthly Probability
Seasonal Trend Plot	WY Trend Plot	WY Accum Vol	Multi WY Accum Vol	Historical Flows
Verification	Build Your Own			

[Back to Ensemble Products Map](#)

[<<< Previous Ensemble Location \(WBG1\)](#) | [Next Ensemble Location \(GYRC1\) >>>](#)

FEATHER RIVER - LAKE OROVILLE (ORDC1)

Latitude: 39.53° N

Longitude: 121.52° W

Elevation: 922 Feet

Location: Butte County in California

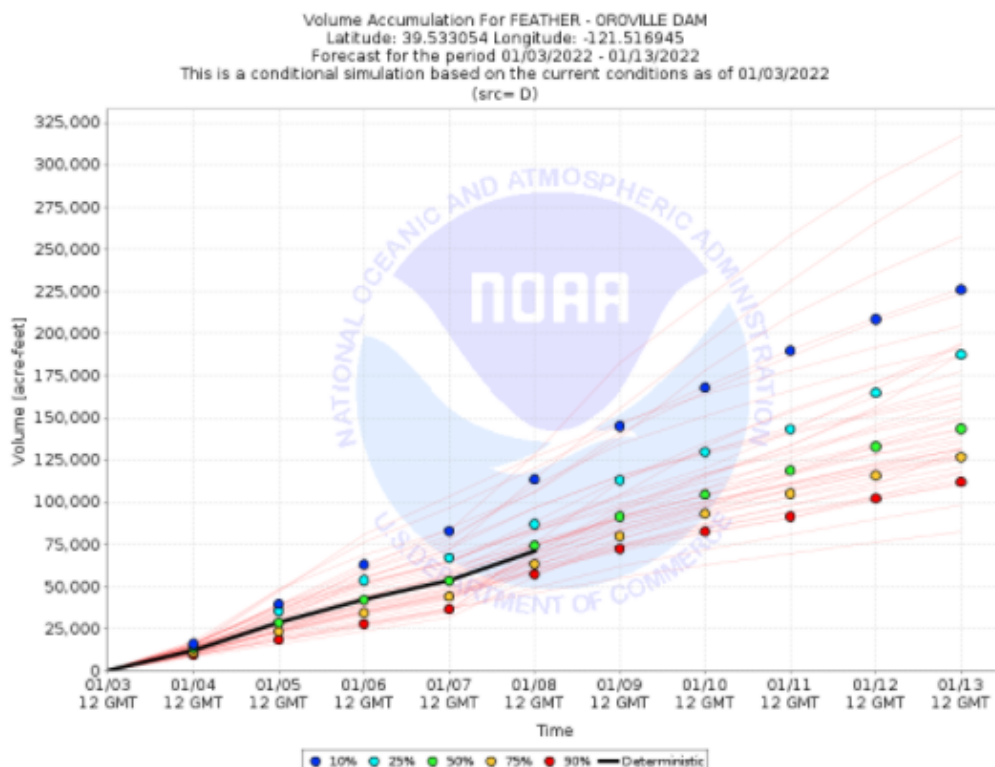
River Group: Lower Sacramento

Issuance Time:

Jan 03 2022 at 8:47 AM PST

PRODUCT NOTE: Ensemble forecasts produced by CNRFC only consider meteorological uncertainty and do not account for hydrologic uncertainty.

10-Day Accumulated Volume Plot



Tabular 10-Day Streamflow Volume Accumulation (1000s of Acre-Feet)										
Data Updated: Jan 03 2022 at 8:49 AM PST										
Probability	Jan 04	Jan 05	Jan 06	Jan 07	Jan 08	Jan 09	Jan 10	Jan 11	Jan 12	Jan 13
10%	16.1	39.7	63.1	82.9	113.5	145.2	168.0	189.7	208.5	225.9
25%	15.0	35.7	53.8	67.1	87.0	113.1	129.9	143.3	164.9	187.5
50% (Median)	13.4	28.6	42.2	53.6	74.5	91.5	104.5	118.8	133.0	143.6
75%	11.0	23.4	34.4	44.2	63.5	79.9	93.4	105.1	115.8	126.8
90%	9.5	18.6	27.8	36.7	57.4	72.6	82.7	91.6	102.4	112.2
CNRFC Deterministic Forecast	12.5	29.1	42.6	54.1	70.8					

Figure 6. CNRFC forecast of 10-day accumulated volume forecast for Lake Oroville (<https://www.cnrfc.noaa.gov/ensembleProduct.php?id=ORDC1&prodID=2>).